

What is claimed is:

1. A method of electrocoating electrically conductive three-dimensional substrates (2) in a continuous
5 installation (1) comprising
 - an electrocoating tank (1.1) containing the electrocoat material,
 - an overflow tank (1.2) containing the electrocoat
10 material,
 - at least one circulating pump (1.3) for drawing off the electrocoat material on the base (1.4) of the overflow tank (1.2),
 - at least one circulating pump (1.5) for drawing
15 off the electrocoat material on the tank base (1.6) at the end (1.7) of the electrocoating tank (1.1) that is opposite the overflow tank (1.2),
 - at least two flood pipes (1.8) for returning the electrocoat material drawn off by way of the
20 circulating pumps (1.3) and (1.5) to the electrocoating tank (1.1) at its base (1.6) in such a way that in the electrocoating tank (1.1) in the longitudinal direction a directed tank flow (1.9) is produced and maintained,
 - 25 - the tank flow (1.9) in the area of the tank base (1.6) being opposite to the tank flow (1.9) in the area of the bath surface (1.10), and

- at least one conveying device (1.11) with means of transporting the substrates (2) to the electrocoating tank (1.1), rotating and immersing the substrates (2) in the electrocoating tank (1.1) at one end thereof in the immersing area (1.12), transporting the substrates (2) through the electrocoating tank (1.1) in the longitudinal direction, and rotating and emerging the substrates from the electrocoating tank (1.1) at its other end, as viewed in the transport direction, in the emerging area (1.13),

wherein the substrates (2)

I. are connected as cathode or anode and

II. with the aid of the conveying device or devices (1.11)

II.1 are supplied over the overflow tank (1.2) to the immersing area (1.12) of the electrocoating tank (1.1),

II.2 on immersion in the electrocoating tank (1.1) are rotated about a horizontal axis perpendicular to the transport direction at an angle of $> 100^\circ$ to the original position,

II.3 are passed in the new orientation through the electrocoating tank (1.1) and coated,

5 II.4 on emersion from the electrocoating tank (1.1) are rotated in the emerging area (1.13) about a horizontal axis perpendicular to the transport direction back into the original position, and

10 II.5 following emersion are passed on for further processing,

which comprises the electrocoat material drawn off by way of the circulating pumps (1.3) and (1.5) being
15 returned by way of the flood pipes (1.8) to the base (1.6) of the electrocoating tank (1.1) in such a way as to produce and maintain a directed tank flow (1.9) which flows in the transport direction of the substrates (2) in the area of the tank base (1.6) and
20 opposite to the transport direction of the substrates (2) in the area of the bath surface (1.10).

2. The method as claimed in claim 1, **wherein** the substrates (2) have cavities.

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3. The method as claimed in claim 1 or 2, **wherein** the substrates (2) are rotated in the transport direction.

4. The method as claimed in any of claims 1 to 3,
wherein the substrates (2) are vehicle bodies,
radiators or casings of washing machines, dishwashers
or ovens.

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5. The method as claimed in any of claims 1 to 4,
wherein the substrates (2) are oriented transverse to
the axis of rotation or longitudinally to the axis of
rotation.

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6. The method as claimed in any of claims 1 to 5,
wherein on immersion in the electrocoating tank (1.1)
the substrates (2) are rotated in the transport
direction at an angle of about 180° or 180° to the
original position.

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7. The method as claimed in any of claims 1 to 6,
wherein on transport through the electrocoating tank
the substrates (2) are moved.

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8. The method as claimed in any of claims 1 to 7,
wherein the substrates (2) are connected as cathode.

9. The method as claimed in claim 8, **wherein** the
electrocoat material is a cathodically depositable
electrocoat material.

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10. The method as claimed in any of claims 1 to 9,
wherein the electrocoat material drawn off by means of

the circulating pumps (1.3) and (1.5) is filtered (1.14) before being returned to the electrocoating tank (1.1).

11. The method as claimed in claim 10, **wherein** the
5 electrocoat material drawn off is subjected to ultrafiltration.

12. The method as claimed in any of claims 1 to 11, **wherein** the continuous installation (1) comprises at
10 least one power supply, electronic, mechanical, and pneumatic measurement and control devices, electric motors, overflow devices, heat exchangers, devices for the supply of electrocoat material, electrocoat material components, and neutralizing agents,
15 ultrafiltration units, filters, anolyte circuits for the cathodically depositable electrocoat material, and rinsing zones.

13. A continuous installation (1) for implementing the
20 method as claimed in any of claims 1 to 12, comprising

- an electrocoating tank (1.1) containing the electrocoat material,
- an overflow tank (1.2) containing the electrocoat
25 material,
- at least one circulating pump (1.3) for drawing off the electrocoat material on the base (1.4) of the overflow tank (1.2),

- at least one circulating pump (1.5) for drawing off the electrocoat material on the tank base (1.6) at the end (1.7) of the electrocoating tank (1.1) that is opposite the overflow tank (1.2),
- 5 - at least two flood pipes (1.8) for returning the electrocoat material drawn off by way of the circulating pumps (1.3) and (1.5) to the electrocoating tank (1.1) at its base (1.6) in such a way that in the electrocoating tank (1.1)
- 10 in the longitudinal direction a directed tank flow (1.9) is produced,
- the tank flow (1.9) in the area of the tank base (1.6) being opposite to the tank flow (1.9) in the area of the bath surface (1.10),
- 15 - at least one conveying device (1.11) with means of transporting the substrates (2) to the electrocoating tank (1.1), rotating and immersing the substrates (2) in the electrocoating tank (1.1) at one end thereof in the immersing area
- 20 (1.12), transporting the substrates (2) through the electrocoating tank (1.1) in the longitudinal direction, and rotating and emerging the substrates from the electrocoating tank (1.1) at its other end in the emerging area (1.13),
- 25 - an immersing area (1.12) at the end of the electrocoating tank (1.1), to which the overflow tank (1.2) connects, and

- an emerging area (1.13) at the other end of the electrocoating tank (1.1) as viewed in the transport direction of the substrates,

5 **wherein** the directed tank flow (1.9) in the area of the bath surface (1.10) is opposite to the transport direction of the substrates (2).

14. The continuous installation (1) as claimed in
10 claim 13, **which comprises** at least one power supply, electronic, mechanical, and pneumatic measurement and control devices, electric motors, pumps, overflow devices, heat exchangers, devices for the supply of electrocoat material, electrocoat material components,
15 and neutralizing agents, ultrafiltration units, filters, anolyte circuits for the cathodically depositable electrocoat material, and rinsing zones.